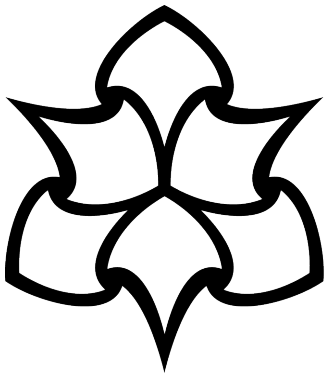

The Positive Effect of Narcissism on Depressive Symptoms through Mental Toughness: Narcissism may be a Dark Trait but it does help with seeing the World Less Grey

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Abstract

Background. Subclinical Narcissism (SN) is part of the Dark Triad (DT), which includes also Subclinical Psychopathy (SP) and Machiavellianism. SN comprises facets retained from the clinical syndrome, such as grandiosity and dominance. Previous cross-sectional and longitudinal research indicates that SN may increase Mental Toughness (MT) resulting in various positive outcomes, including lower levels of psychopathy. **Method.** The researchers conducted three studies (N = 364, 244 and 144 for Study 1, 2 and 3 respectively) to test if the path model from SN to higher MT predicted lower symptoms of depression (DS). An extension to the model considered Openness to Experience (OE) as a possible mediator. Participants completed self-report measures of SN, MT, OE and DS. In Study 3, participants responded to an additional measure of SN to allow differentiation between grandiose and vulnerable aspects. **Results.** SN exerted a negative indirect effect on DS through MT across studies; and a negative indirect effect on DS through MT and OE in Study 2. In Study 3, Grandiose SN increased MT contributing to lower DS. Vulnerable SN demonstrated the reverse pattern. MT subfactors of Control and Confidence had a mediating effect across studies. **Conclusion.** The current findings support the model that SN to MT predicts positive outcomes in various domains, including lower levels of psychiatric symptoms. Exploring the link between SN with prosocial traits can be particularly helpful when seeking to identify and promote SN's adaptive tendencies against symptoms of psychopathology.

Keywords: grandiose narcissism, mental toughness, subclinical narcissism, symptoms of depression, vulnerable narcissism.

1.0 Introduction

Various personality factors are associated with symptoms of psychopathology (1). Symptoms of psychopathology vary depending upon an individual's personality traits, and personality traits may influence the presence of symptoms of psychopathology (2). Exploring factors that potentially guard against psychopathology, such as indicators of depression (DS) is of paramount importance because of the prevalence of depression (there are over 298 million sufferers worldwide) (3). Depression has been associated with an increased risk of mortality in general community populations, as well as in patient populations with chronic illnesses, such as coronary heart disease, cancer, diabetes and stroke (4). The researchers conducted three studies to explore the degree to which Subclinical Narcissism (SN) predicted indirectly lower DS, through Mental Toughness (MT) and the Big Five (BF) personality trait of Openness to Experience (OE).

1.1 Subclinical Narcissism, Mental Toughness and Psychopathology

Subclinical Narcissism (SN) is part of the Dark Triad (DT), a personality cluster defined at the subclinical level. This includes the traits of Subclinical Psychopathy (SP) and Machiavellianism (5). SN includes facets retained from the clinical syndrome, namely grandiosity, entitlement, dominance and superiority (5). SN includes two main types: Grandiose Narcissism (GN) and Vulnerable Narcissism (VN) (6). GN is characterised by exhibitionism, lack of humility/modesty and interpersonal dominance. VN encompasses negative affect, distrust, selfishness, and a need for attention and recognition (7) (8). Research suggests that GN links mainly to positive outcomes, whereas VN predicts negative outcomes (9). For example, a recent study observed that participants scoring high on VN also reported higher DT traits, lower Mental Toughness (MT), poor sleep quality, and higher scores on perceived stress (10).

Previous studies suggest that SN might be unique among the DT traits in that, it encapsulates to a large extent prosocial and adaptive behaviours (11). For example, a series of five studies indicated positive associations between SN and daily and dispositional subjective well-being, and couple well-being. Negative associations were found between SN and daily sadness, dispositional depression, daily and dispositional loneliness, daily anxiety and dispositional neuroticism (12).

More recently, several studies (13) (14) (15) (16) have reported moderate positive correlations between SN and MT. MT reflects an effective coping mechanism as reaction to stressors. Specifically, MT allows individuals to proactively seek out opportunities for personal growth (17). Many studies have shown that MT is a personality trait that acts as a resilient factor against psychopathology (see 18 for a review). Congruently, both cross-sectional and longitudinal research has consistently linked high MT to significantly lower DS (19) (20) (21).

In terms of the factors that may influence MT, studies using both cross-sectional and longitudinal designs have shown that SN may increase MT. This results in various positive outcomes, such as lower psychopathy and higher school grades (15) (16). Furthermore, the authors concluded that the path model from SN to MT to a further outcome might predict positive effects across various contexts, including psychopathology.

1.2 Subclinical Narcissism, Mental Toughness and Openness to Experience

Both SN and MT have been associated with the Big Five trait of Openness to Experience (OE) (22) (23). In fact, a study reported that the correlation between SN and OE was the strongest out of all correlations between SN and the other four BF traits (Conscientiousness, Extraversion, Neuroticism and Agreeableness) (22). Another study reported that OE correlated with MT and in particular, with the MT facets of *interpersonal confidence* and *challenge* (23). Confidence is the strongest correlate (out of all four facets of MT) between MT and SN (15). The link between Challenge and OE may be explained

conceptually by the fact that individuals that score high on Challenge perceive change and new experiences as an opportunity for growth rather than as a threat (24).

Collectively, these findings suggest that individuals scoring high on SN and MT may be particularly open to experiences. Particularly, that they possess the inclination and confidence to seek out new opportunities for personal growth.

1.3 The Present Investigation

The present investigation explored a statistical model testing the notion that SN increases MT and OE contributing indirectly to lower DS. Extensions to the model further examined whether the grandiose, as opposed to the vulnerable aspect of SN, increased MT leading to positive outcomes. It was hypothesised that (1) SN would exert a significant negative indirect effect on DS through MT across studies. The researchers posited also that (2) SN would exert a significant negative indirect effect on DS through MT and OE in Study 2 and 3. Furthermore, it was predicted (3) that GN would exert a significant negative indirect effect on DS through MT and OE (Study 3). Finally, it was anticipated (4) that VN would exert a significant positive indirect effect on DS through MT and OE (Study 3).

2.0 Method

2.1 Sample

Three studies tested hypotheses 1 to 4. The first examined whether SN exerted a significant negative indirect effect on DS through MT. The second replicated the findings of the first study with an independent sample, and developed the model by testing whether SN exerted a significant negative indirect effect on DS through MT and OE. The third replicated the findings of Studies 1 and 2, and further extended the model by assessing the differential effect of GN (as opposed to VN) on DS through MT and OE. Progressive extension of the tested model provided an increasingly sophisticated understanding of variable relationships.

2.1.1 Study 1. Participants (*N* = 364) were recruited online through advertisements on social networks (e.g., Facebook) and word of mouth. Participant mean age was 24.31 years (*SD* = 9.16, *range* = 18-79); 56.9% were females. Inspection of univariate outliers identified that three z-scores exceeded 3.5 standard deviations (SDs). These were removed (25). Multivariate outliers exist when data points exceed Cook's distance of 1.0 (26). No responses surpassed Cook's distance. Skewness values were within the recommended range of -2.0 to +2.0 SDs from the mean (27). Specifically, MT = -0.32; Challenge = -0.27; Commitment = -0.14; Control = -0.42; Confidence = -0.40; Narcissism = -0.01; Depression = 1.33. Participants did not receive compensation for taking part.

2.1.2 Study 2. Participants (*N* = 364) were also recruited online through advertisements on social networks (e.g., Facebook) and word of mouth. Participant mean age was 25.30 years (*SD* = 7.22, *range* = 18-59); 64.75% females. Examination of outliers resulted in the removal of five data points. No issues existed with skewness, MT = 0.12; Challenge = -0.58; Commitment = -0.02; Control = 0.15; Confidence = -0.12; Narcissism = -0.09; Openness = -0.20; Depression = 1.19. Participants received no compensation for taking part.

2.1.3 Study 3. Participants (*N* = 144) were undergraduate students recruited through advertisements in the class and university. They enrolled to participate through the Sona system, which manages research participation. Specifically, it allows students to browse ongoing research and enrol to studies. Participant mean age was 22.08 years (*SD* = 5.50, *range* = 18-52); 86.1% females. Twenty-three participants did not disclose their age. Assessment of univariate outliers supported removal of four data points. Cook's distance values were below 1.0. Skewness results fell between -2 and +2 SDs (Table 1). Once participants completed the study, they received credits as part of course fulfilment.

2.2 Measures

2.2.1 Study 1. Used the 9-item narcissism scale of the Short Dark Triad questionnaire (SD3) (28) to assess Subclinical Narcissism (Cronbach's alpha = 0.70). The Mental Toughness Questionnaire 48 (MTQ48) (24) measured the four dimensions of MT (Control, Confidence, Challenge and Commitment, respectively) and total MT (Cronbach's alpha = 0.88, 0.53, 0.80, 0.53, and 0.80 for total MT). The Patient Health Questionnaire 9 (PHQ-9) (31) assessed the DSM-IV symptoms of major depressive disorder (Cronbach's alpha = 0.76).

2.2.2 Study 2. Again, employed the SD3 (28) (Cronbach's alpha = 0.67), MTQ48 (24) (Cronbach's alpha = 0.88, 0.50, 0.81, 0.58, and 0.74 for total MT), and the PHQ-9 (31) (Cronbach's alpha = 0.86). These were presented alongside the 10-item scale of the Big Five Inventory (BFI) (30), which measured OE (Cronbach's alpha = 0.72).

2.2.3 Study 3. Once more used the SD3 (28) (Cronbach's alpha = 0.73), MTQ48 (24) (Cronbach's alpha = 0.92, 0.72, 0.84, 0.74, and 0.82 for total MT) and the 10-item BFI (30) (Cronbach's alpha = 0.76). These core scales were presented together with the Five-Factor Narcissism Inventory – Short Form (FFNI-SF) (29) (Cronbach's alpha = 0.92 and 0.82 for the scales of Grandiose and Vulnerable Narcissism), and The Beck Depression Inventory (BDI) (32) (Cronbach's alpha = 0.90). Detailed information on the measures appears in the supplementary material section.

2.3 Procedure

Combined measures formed a single document. In Study 1 and 2, the online platform SurveyMonkey (www.surveymonkey.com) hosted this in electronic form. Participants accessed the questionnaire via a message containing a link, a password and a unique participant code. For Study 3, participants completed paper and pencil copies of the booklets within the university. Questionnaire completion was self-paced.

2.4 Analysis

Inspection of descriptive statistics and intercorrelation preceded tests of mediation. Mediation analysis used Process (Model 4) (42) with bootstrapping (1000 resamples) to generate indirect effect estimates with 95% bias-corrected confidence intervals.

In Study 1, the mediation model examined DS as the outcome variable, SN as the predictor and MT as a mediator. Study 2 assessed OE in addition to MT as mediators of the SN-DS relationship. Mediation analysis in Study 3 built upon Study 2 by testing whether facets of SN (GN and VN) had an indirect effect on DS through MT and OE. Specifically, Model 3 assessed GN as a predictor (controlling for VN). Mediator variables were MT and OE, with DS the outcome. Analysis of Model 4 tested VN as a predictor (controlling for GN). For comparison purposes, analysis considered also total SN in Model 5. Given MT is multidimensional (34), subfactors of Challenge, Commitment, Control and Confidence were examined as mediators in each study in addition to total MT.

For assessing mediation, various effects and statistical weights exist. The total effect (*c* weight) of a predictor on an outcome comprises an indirect effect (*a*b* weight) and a direct effect controlling for the influence of a mediator (*c'* weight). Weight *a* relates to the effect of the predictor on the mediator. Weight *b* is the effect of the mediator on the outcome while excluding the effect of the predictor. An indirect effect represents a combination of the regression weight of the predictor on the mediator and the regression weight of the mediator on the outcome.

3.0 Results

3.1 Study 1

Inspection of descriptive statistics and intercorrelations revealed significant relationships between SN ($M = 2.93$, $SD = 0.57$) and MT ($M = 3.44$, $SD = 0.37$) ($r = 0.40$), SN and DS ($M = 5.43$, $SD = 4.52$) ($r = -0.16$), and MT and DS ($r = -0.53$). Analysis of Model 1 (Figure 1) found that SN positively predicted MT and negatively predicted DS (*a* weight). MT

possessed a negative relationship with DS (*b* weight) and a mediating effect as indicated by a significant *a*b* weight. The direct effect of SN was non-significant (*c'* weight), supporting presence of mediation in addition to a meaningful indirect effect. Since the model was cross-sectional, reversing the paths between DS and SN revealed a considerably weaker indirect effect (*a*b* weight = -0.02 vs. -1.77). Similarly, a model assessing SN as mediator between MT-DS revealed a non-significant indirect effect, *a*b* = 0.31, 95% CI [-0.16, 0.84], supporting the direction in Model 1.

(Figure 1 here)

Further scrutiny of MT subfactors revealed significant indirect effects of SN on DS through Challenge, *a*b* = 0.40, 95% CI [0.18, 0.74], Commitment, *a*b* = -0.29, 95% CI [-0.64, -0.08], Control, *a*b* = -0.32, 95% CI [-0.63, -0.11], and Confidence, *a*b* = -1.86, 95% CI [-2.60, -1.22]. All subfactors were in the expected direction apart from Challenge, which evidenced a positive mediating effect on DS. Study 1 data available via figshare: http://dx.doi.org/10.6084/m9.figshare.6887123

3.2 Study 2

Analysis followed the same steps as Study 1. Descriptive statistics and intercorrelations revealed significant relationships between SN (*M* = 2.88, *SD* = 0.55) and MT (*M* = 3.42, *SD* = 0.38) (*r* = 0.44), SN and OE (*M* = 3.46, *SD* = 0.51) (*r* = 0.27), MT and DS (*M* = 7.13, *SD* = 5.43) (*r* = -0.51), and SN and DS (*r* = -0.13). No significant association existed between OE and DS.

Analysis of Model 2 (Figure 2) indicated that SN positively predicted MT and OE (*a* weights). MT negatively predicted DS, whereas OE positively predicted DS (*b* weights). SN had a significant indirect effect on DS through MT and OE (*a*b* weights). Additionally, a non-significant *c'* path supported mediation. Reversing paths between SN and DS revealed considerably weaker indirect effects (MT *a*b* weight = -0.02 vs. -2.59; OE *a*b* weight = 0.01

vs. 0.52). Assessing SN as mediator of MT-DS revealed a non-significant indirect effect, *a*b* = 0.43, 95% CI [-0.24, 1.14]. Testing MT as a mediator of OE-DS (controlling for SN) reported a non-significant total effect, *c* = 0.05, 95% CI [-0.08, 0.19], supporting variable direction in Model 2. OE possessed a non-significant correlation with DS but a significant mediating effect. Possibly, this was due to shared variance with SN and MT. The correlation between OE and DS reached significance when controlling for the effects of SN and MT, partial $r = 0.22$, $p = 0.001$.

(Figure 2 here)

Scrutiny of MT subfactors revealed significant indirect effects of SN on DS via Control, *a*b* = -3.48, 95% CI [-5.86, -1.11], and Confidence, *a*b* = -4.24, 95% CI [-5.98, -2.51]. As with Model 2, OE exerted a significant mediating effect, *a*b* = 0.41, 95% CI [0.15, 0.80]. This is likely due to shared variance given the correlation between OE and DS was significant when controlling for SN and MT subfactors, partial $r = 0.17$, $p = 0.008$. Study 2 data available through figshare: http://dx.doi.org/10.6084/m9.figshare.6887132

3.3 Study 3

Consideration of zero-order correlations revealed several significant associations (Table 1). Grandiose Narcissism (GN), SN and MT correlated positively. OE was positively associated with SN and MT. DS correlated negatively with GN, SN and MT, and positively with Vulnerable Narcissism (VN). There was no significant relationship between DS and OE.

(Table 1 here)

Model 3 (Figure 3) revealed GN positively predicted MT (not OE) and VN negatively predicted MT (not OE) (*a* weights). MT and OE revealed negative and positive relationships with DS respectively. GN had a significant indirect effect on DS through MT (*a*b* weight). OE did not have a mediating effect.

Model 4 (Figure 3) reported identical *a* and *b* weights. VN had a significant indirect effect on DS via MT (*a*b* weight). OE did not have a mediating effect. Note the negative relationship between MT and DS in Model 3 and 4, and the non-significant direct effects of GN and VN (*c'* weights). These results, alongside significant indirect effects, support mediation. Reversing relationships reported a comparatively weaker indirect effect through MT with both GN (*a*b* weight = -0.01 vs. -3.26) and VN (*a*b* weight = 0.02 vs. 4.66). Similarly, testing MT as a mediator of OE-DS (controlling for GN and VN) reported a non-significant total effect, $c = 0.79$, 95% CI [-1.10, 2.70].

(Figure 3 here)

Analysis of MT subfactors for Model 3 revealed significant indirect effects of GN on DS through Control, $a*b = -1.38$, 95% CI [-2.87, -0.33], and Confidence, $a*b = -1.53$, 95% CI [-3.33, -0.38]. For Model 4, significant indirect effects of VN on DS occurred via Control, $a*b = 2.62$, 95% CI [0.39, -5.40], and Confidence, $a*b = 1.78$, 95% CI [0.44, 3.48]. Similar to Models 3 and 4, OE did not exert a mediating effect.

In comparison with Study 1 and 2, Model 5 (Figure 4) indicated SN positively predicted MT and OE (*a* weights). MT evinced a negative relationship with DS, and OE positively predicted DS (*b* weights). MT had a negative mediating effect, whereas OE exhibited a positive mediating effect (*a*b* weights). Weaker mediation effects were evident in the context of reversed relationships for both MT (*a*b* weight = -0.02 vs. -4.58) and OE (*a*b* weight = 0.01 vs. 0.47). Assessing SN as mediator of MT-DS (controlling for OE) revealed a non-significant indirect effect, $a*b = 0.68$, 95% CI [-0.39, 2.08].

(Figure 4 here)

Lastly, given OE demonstrated a non-significant correlation with DS but a significant mediating effect, controlling for MT and SN revealed a significant association, partial $r = 0.19$, $p = 0.028$. This indicates that MT and SN inflated the link between OE and DS. The results of

these further analyses are consistent with Study 1 and Study 2. Data for Study 3 available through figshare: http://dx.doi.org/10.6084/m9.figshare.6887135

4.0 Discussion

The path model, from Subclinical Narcissism (SN) to higher Mental Toughness (MT) to a positive outcome, is a reliable and strong predictor of lower symptoms of depression (DS). Explicitly, the results demonstrate that SN, assessed with the SD3 (28), increases MT resulting in significantly lower DS in three independent samples. Importantly, the results were stable across studies explaining almost 30% of the variation in DS. Assessment of MT subfactors replicated these results in relation to Control and Confidence. Considering the conceptual link between MT Challenge and the Big Five trait of Openness to Experience (OE), the authors extended the proposed mediation model showing (in Study 2) that SN may decrease DS through OE. Study 3, however, did not replicate this finding. This was possibly due to small sample size.

Previous investigations (15) (16) have acknowledged that, scores for SN obtained using the SD3 might be biased towards assessing narcissism as a prosocial trait, linked to healthy self-esteem, rather than evaluating the antisocial aspects of narcissism (see also 43). To account for this bias, the researchers included an additional valid measure of SN, the short form of the FFNI (29), which differentiates between Grandiose SN and Vulnerable SN. This illustrated that GN may predict lower psychiatric symptoms (DS) through MT. Whereas VN exerted a positive indirect effect on DS through MT explaining more than 40% of the variation in DS.

This investigation shares well-reported limitations with other research in the domains of personality and psychopathology. Namely, self-report data may be influenced by common-method variance (44), and social desirability, particularly in the context of the assessment of a "dark" trait (narcissism). Another potential limitation of this investigation is that the researchers did not employ survey validity checks (45) to ensure that measures were reliably

completed. This does not appear to have significantly influenced the results because Study 3 (completed via pen and paper) produced similar findings (correlations and mediation models) to Study 1 and 2.

Additionally, the studies were cross-sectional, which precludes definitive conclusions concerning the causal order of the variables. Mitigating this concern, a test of reverse relationships supported the hypothesised variable order, and previous longitudinal work is consistent with the notion that Mental Toughness mediates the effects of narcissism (cf. 15).

The present investigation provides new and counterintuitive insights into the role of a seemingly "dark" trait in reducing indirectly and significantly psychiatric symptoms in the general population. Current (and previous) findings, suggest that simply including the SN into the DT, as a trait that links to poor and toxic psychosocial outcomes, requires revision. This suggestion finds partial support in a recent large meta-analysis and critical review of the literature on the DT traits: the study failed to report statistically significant correlations between SN and various measures of negative psychosocial outcome, such as, antisocial tactics, aggression, sex-related issues and morality problems (with the exception of a weak positive correlation between SN and interpersonal difficulties), when controlling for SP and Machiavellianism (46).

5.0 Conclusion

The present investigation has direct theoretical and indirect applied implications. The findings support the view that SN is a complex personality trait involving both positive (grandiose) and negative (vulnerable) aspects. Exploring its relation to prosocial traits, such as MT, can be particularly helpful when trying to identify and promote SN's adaptive tendencies. Studying the proposed path model from SN to higher MT, while considering other personality traits (e.g. Openness to Experience) and the distinction between GN and VN, may explain and predict variation in psychiatric symptoms. Considering the malleability of personality traits,

joint intervention programmes could promote the adaptive—rather than maladaptive—aspects of SN and train MT in an attempt to reduce DS and possibly other psychiatric symptoms.

Data deposition

Data is accessible through figshare:

http://dx.doi.org/10.6084/m9.figshare.6887123(Study1);

http://dx.doi.org/10.6084/m9.figshare.6887132(Study2);

http://dx.doi.org/10.6084/m9.figshare.6887135(Study3)

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Table 1 Descriptive statistics and correlations for Study 3 variables ($N = 140$)

Variable	*M*	*SD*	Skew	1	2	3	4	5	6	7	8	9	10
1. Grandiosity	2.38	0.51	0.70		-0.07	0.70***	0.40***	0.37***	0.21*	0.31***	0.45***	0.11	-0.19*
2. Vulnerability	3.13	0.63	-0.36			-0.17*	-0.66***	-0.57***	-0.48***	-0.67***	-0.62***	-0.05	0.53***
3. Narcissism	2.56	0.57	0.25				0.46***	0.37***	0.29**	0.31***	0.51***	0.23**	-0.21*
4. Mental	3.25	0.42	-0.32					0.77***	0.84***	0.85***	0.89***	0.22**	-0.64***
Toughness													
5. Challenge	3.38	0.56	0.01						0.57***	0.62***	0.64***	0.31***	-0.43***
6. Commitment	3.35	0.56	-0.16							0.66***	0.60***	0.23**	-0.51***
7. Control	3.02	0.47	-0.31								0.68***	0.11	-0.62***
8. Confidence	3.19	0.57	-0.33									0.13	-0.57***
9. Openness	3.51	0.60	-0.08										0.01
10. Depression	10.34	8.16	1.16										

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

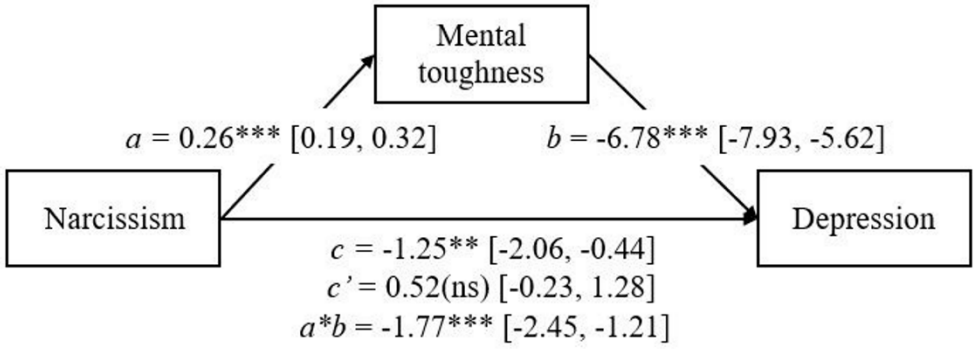

Figure 1. Model 1: Mediation effects of Mental Toughness in the relation between narcissism and depression. *Note.* R^2 for final model = 28.89%; results are based on 1000 bootstrap samples; values in square brackets indicate bias-corrected 95% confidence intervals; $^{**}p < 0.01$, $^{***}p < 0.001$

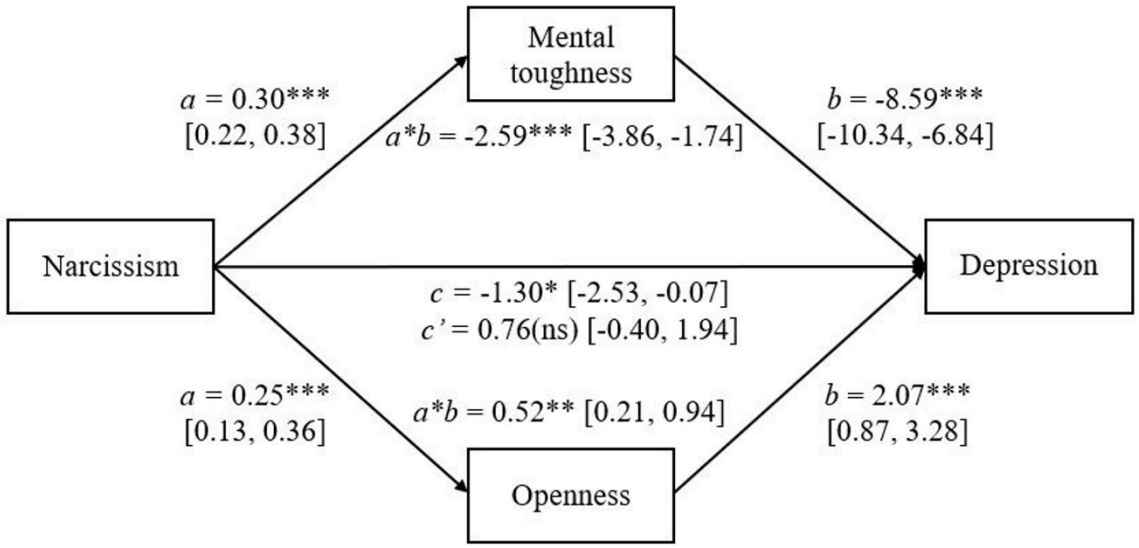

Figure 2. Model 2: Mediation effects of Mental Toughness and openness in the relation between narcissism and depression. *Note.* R^2 for final model = 30.03%; results are based on 1000 bootstrap samples; values in square brackets indicate bias-corrected 95% confidence intervals; $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

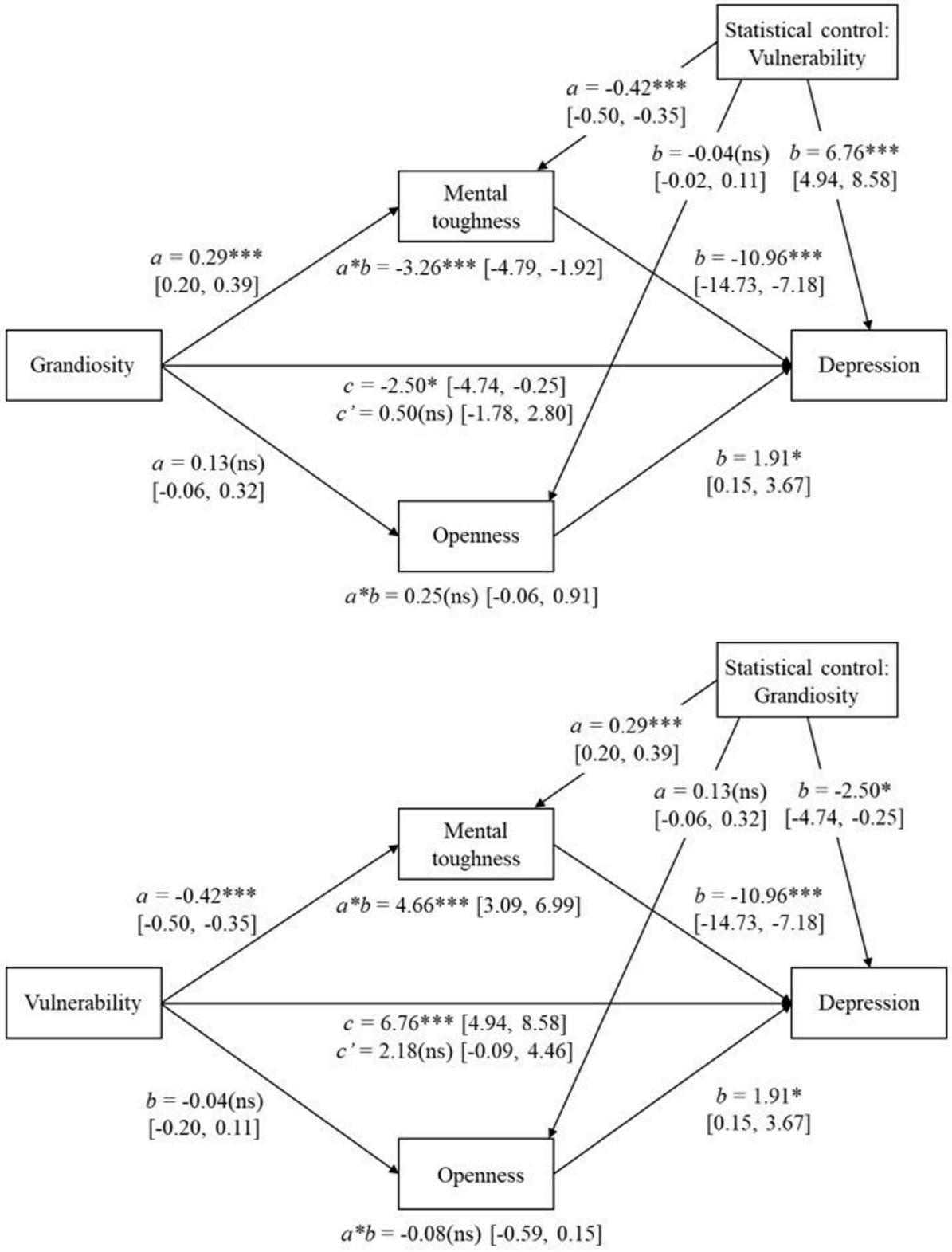

Figure 3. Models 3 and 4: Mediation effects of Mental Toughness and openness in the relation between grandiosity, vulnerability and depression. *Note.* R^2 for Model 3 = 44.75%, R^2 for Model 4 = 44.75%; results are based on 1000 bootstrap samples; values in square brackets indicate bias-corrected 95% confidence intervals; *$p < 0.05$, ***$p < 0.001$

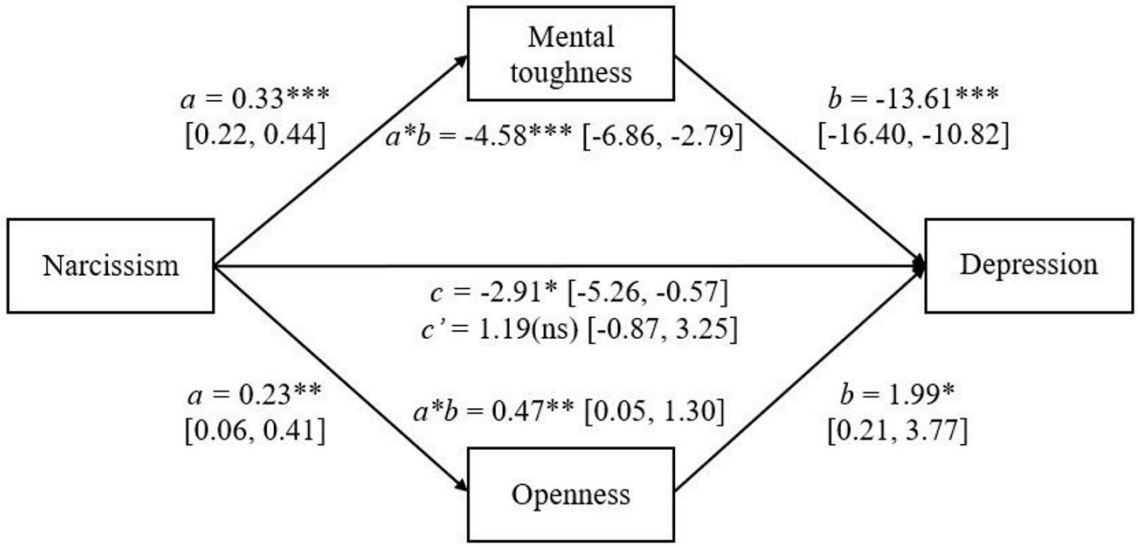

Figure 4. Model 5: Mediation effects of Mental Toughness and openness in the relation between narcissism and depression. *Note.* R^2 for final model = 43.40%; results are based on 1000 bootstrap samples; values in square brackets indicate bias-corrected 95% confidence intervals; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Supplementary Information

Subclinical Narcissism (SN). The SD3 assesses Subclinical Narcissism, Subclinical Psychopathy and Machiavellianism and it has high reliability and validity, including construct validity and external validity (28). The SD3 includes 27 items, 9 for each scale with responses given on a 5-point Likert scale, with *1 = strongly disagree* and *5 = strongly agree*. We used only the 9 items that assess Subclinical Narcissism. Example items include: "*People see me as a natural leader*". The score for the subscale represents the average score of the 9 corresponding items.

We also used the 60-item short form of the FFNI (29). The average completion time is 20 minutes and each item is scored on a 1 to 5 scale, where *1 = the statement is false or that you strongly disagree* and *5 = the statement is definitely true or you strongly agree*. Grandiose

Narcissism (GN) derives by estimating the sum of the following subscales: *Indifference, Exhibitionism, Authoritativeness, Grandiose Fantasies, Manipulativeness, Exploitativeness, Entitlement, Lack of Empathy, Arrogance, Acclaim Seeking,* and *Thrill Seeking.* Vulnerable Narcissism (VN) derives by estimating the sum of the following subscales: *Reactive Anger, Shame, Need for Admiration,* and *Distrust.* Studies have shown that the grandiose and vulnerable composites behave almost identically across the short- and long-form versions so that the FFNI–Short Form (FFNI-SF) offers a well-articulated assessment of the basic traits comprising GN and VN (29).

Mental Toughness (MT). The Mental Toughness Questionnaire 48 (MTQ48) is the most frequently used measure of MT (24). The MTQ48 has an average completion time of 10 minutes and responses to its 48 items are given on a 5-point Likert scale anchored at *1 = strongly disagree* and *5 = strongly agree*. A mean MT score can be calculated by summing up individual items of the questionnaire and dividing by the total number of items. Twenty-two items are reverse coded. Example items include "*I can usually adapt myself to challenges that come my way*" and "*I don't usually give up under pressure*". The MTQ48 has generally shown good reliability (33) (34). Previous studies have verified the instrument's construct and criterion validity, and the MTQ48 has received support for its multidimensional factor structure (comprising facets of Challenge, Commitment, Control and Confidence) through confirmatory factor analyses and exploratory structural equation modelling (24, 34).

2.2.3 Openness to Experience (OE). The Big Five Inventory (BFI) (30) is a 44-item questionnaire measuring the Big Five personality traits (35). These correspond to Openness to Experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism. This measure consists of short statements rated by participants on a 5-point Likert scale (1= "Strongly Disagree" to 5= "Strongly Agree"). In Study 1 to 3 we used the 10-item scale of the BFI assessing Openness to Experience. This scale requires participants to respond to statements

such as “I see myself as someone who is original, comes up with new ideas”. The overall score is obtained by adding participants’ responses. The questionnaire has a completion time of 5 minutes approximately. The validity and reliability of the BFI and its subscales has been widely documented in literature (36) (37).

2.2.4 Depressive Symptoms (DS). The Patient Health Questionnaire 9 (PHQ-9) (31) was used to measure the DSM-IV symptoms of major depressive disorder in Study 1 and 2. It has an average completion time of less than 2 minutes and assesses how often the respondent has experienced symptoms of depression over the past two weeks. Responses to its nine items are given by assigning values of 0 to 3 points (0 = not at all, 1 = several days, 2 = more than half of the days, and 3 = nearly every day). An overall score can be calculated by summing up the scores that were reported for individual items of the questionnaire; higher scores indicate more symptoms of depression. Example items include "Feeling down, depressed, or hopeless" and "Feeling tired or having little energy". The PHQ-9 not only recognizes clinical depression but also subthreshold levels of depressive symptoms in the general population (38). High internal consistency, test-retest reliability as well as construct and criterion validity have been demonstrated in past investigations (39).

In Study 3, we have used the Beck Depression Inventory (BDI), a 21-item, self-report rating inventory that measures characteristic attitudes and symptoms of depression (32). The BDI takes approximately 10 minutes to complete, although clients require a fifth – sixth grade reading level to adequately understand the questions (40). Internal consistency for the BDI ranges from 0.73 to 0.92 with a mean of 0.86 (41). Similar reliabilities have been found for the 13-item short form (40). The BDI demonstrates high internal consistency, with alpha coefficients of 0.86 and 0.81 for psychiatric and non-psychiatric populations respectively (41).